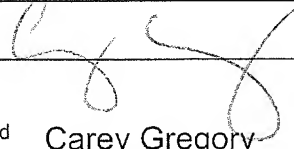
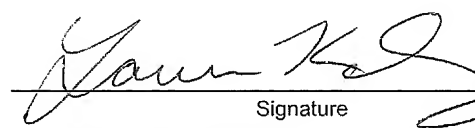


<b>PRE-APPEAL BRIEF REQUEST FOR REVIEW</b>		Docket Number (Optional) <div style="text-align: center; font-size: 1.2em;">5347-223</div>	
<p>I hereby certify that this correspondence is being transmitted electronically to the U.S. Patent and Trademark Office</p> <p>on <u>May 29, 2007</u></p> <p>Signature <u></u></p> <p>Typed or printed name <u>Carey Gregory</u></p>		Application Number <div style="text-align: center; font-size: 1.2em;">10/785,615</div>	Filed <div style="text-align: center; font-size: 1.2em;">02/24/2004</div>
		First Named Inventor <div style="text-align: center; font-size: 1.2em;">Jeffry A. Kelber</div>	
		Art Unit <div style="text-align: center; font-size: 1.2em;">2841</div>	Examiner <div style="text-align: center; font-size: 1.2em;">Tuan T. Dinh</div>
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p> <p>I am the</p> <div style="display: flex; justify-content: space-between;"><div style="width: 45%;"><p><input type="checkbox"/> applicant/inventor.</p><p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p><p><input checked="" type="checkbox"/> attorney or agent of record. <span style="margin-left: 20px;">48,441</span> Registration number _____</p><p><input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____</p></div><div style="width: 45%; text-align: center;"><div style="font-size: 1.5em; margin-bottom: 5px;"></div><div style="text-align: right; font-size: 0.8em;">Signature</div><div style="text-align: center; font-size: 1.2em; margin-bottom: 5px;">Laura M. Kelley</div><div style="text-align: right; font-size: 0.8em;">Typed or printed name</div><div style="text-align: center; font-size: 1.2em; margin-bottom: 5px;">919-854-1400</div><div style="text-align: right; font-size: 0.8em;">Telephone number</div><div style="text-align: center; font-size: 1.2em; margin-bottom: 5px;">May 29, 2007</div><div style="text-align: right; font-size: 0.8em;">Date</div></div></div> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"><p><input type="checkbox"/> *Total of _____ forms are submitted.</p></div>			

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Jeffry A. Kelber et al.

Examiner: Tuan T. Dinh

Serial No.: 10/785,615

Group Art No.: 2841

Filed: February 24, 2004

Confirmation No.: 2942

For: CONDUCTORS CREATED BY METAL DEPOSITION USING A  
SELECTIVE PASSIVATION LAYER AND RELATED METHODS

May 29, 2007

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**REASONS IN SUPPORT OF APPLICANTS'  
PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Sir:

This document is submitted in support of the Pre-Appeal Brief Request for Review filed concurrently with a Notice of Appeal in compliance with 37 C.F.R. 41.31 and with the rules set out in the OG of July 12, 2005 for the New Appeal Brief Conference Pilot Program.

It is not believed that an extension of time and/or any additional fee(s) are required beyond those that may otherwise be provided for in documents accompanying this paper. In the event, however, that an extension of time is necessary to allow consideration of this paper, such an extension is hereby petitioned under 37 C.F.R. §1.136(a). Any additional fees believed to be due in connection with this paper may be charged to our Deposit Account No. 50-0220.

**REMARKS**

Applicants hereby request a Pre-Appeal Brief Review (hereinafter "Request") of Claims 28-32, which were finally rejected under § 102(e) as being anticipated by U.S. Patent No. 6,800,542 to Kim ("Kim") and of Claims 33-36, which were finally rejected under § 102(e) as being anticipated by U.S. Patent Publication No. 2005/0124154 to Park et al. ("Park") in the Final Office Action of February 26, 2007 (the "Final Action"). Applicants respectfully submit that the recitations of the claims

are not described or suggested by Kim or Park. Therefore, one or more elements needed for a *prima facie* rejection under 35 USC §102(e) are, therefore, simply not present. Therefore, Applicants respectfully request review of the present application by an appeal conference prior to the filing of an Appeal Brief. In the interest of brevity, and without waiving the right to argue additional grounds should this Request be denied, Applicants will merely point out the Examiner's omissions of one or more essential elements needed for a *prima facie* rejection.

**Claims 28-32 are not anticipated by Kim**

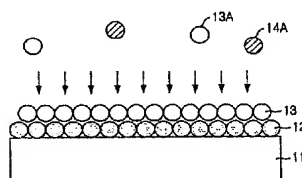
Claim 28 recites a conductive structure including:

- a first conductor;
- a plurality of atomic layers of a second conductor directly on the first conductor; and
- a first solid material directly on the plurality of atomic layers of the second conductor, remote from the first conductor, the first material being penetrable by the plurality of atomic layers of the second conductor relative to at least a second material other than the second conductor.

Applicants submit that Kim does not disclose at least the underlined portion of independent Claim 28. The Final Action on page 2 identifies the materials **13A** and **14A** as equivalent to the first solid material. However, the materials **13A** and **14B** are clearly described by Kim as being a gaseous material and not a solid as recited in Claim 28. In particular, column 3, lines 47-55 of Kim refers to **Figure 1B** (reproduced below) as follows:

As shown in **FIG. 1B**, hydrazine ( $N_2H_4$ ) **13**, which is a reaction gas, is injected ... and ... is reacted with Ru precursor **12** absorbed on the surface of the substrate **11** so that the Ru and volatile by-products, such as HX,  $NH_3$  and  $N_2$  are produced.... [T]he purge gas is injected again in order to remove the volatile by products **14A** and a non-reacted hydrazine **13A** and a highly pure Ru thin layer is finally deposited.

FIG. 1B



Therefore, the components **13A**, **14A**, which the Action identifies as the first solid material, are clearly a gas and not a solid as recited in Claim 28.

In addition, the components **13A**, **14A** are not directly on the layer **13** (which the Final Action identifies as the plurality of atomic layers of the second conductor). **Figure 1B** clearly illustrates a gap between the components **13A**, **14A** and the layer **13**.

Therefore, Kim does not teach or suggest at least a first solid material directly on the plurality of atomic layers of the second conductor. Claim 28 is patentable for at least these reasons. Claims 29-32 are patentable at least as depending from patentable Claim 28.

**Claims 33-36 are not anticipated by Park**

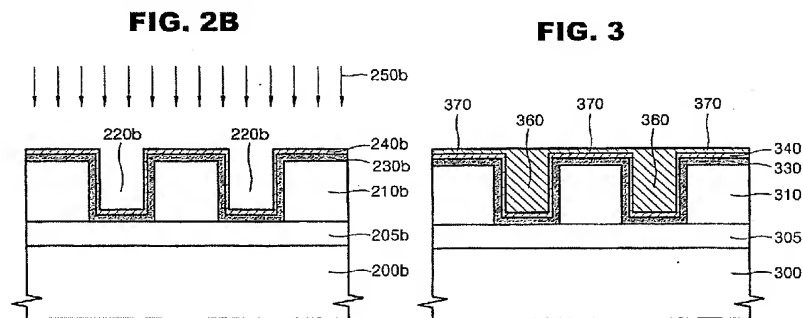
Claim 33 recites a conductive structure including:

- a first layer comprising ruthenium;
- a second layer comprising a plurality of atomic layers of copper directly on the first layer comprising ruthenium; and
- a third layer comprising iodine directly on the second layer comprising a plurality of atomic layers of copper, remote from the first layer comprising ruthenium.

Applicants submit that Park does not disclose various recitations of Claim 33. The Action takes the position that the barrier layer **330** is the "first layer comprising ruthenium" the adhesion layer **340** is the "second layer comprising a plurality of atomic layers of copper," and the layer **370** is the "third layer comprising iodine." *See* the Action, page 3.

Park discusses that the barrier layer **330** may be formed of ruthenium. *See* Park, paragraph 22. However, Park proposes various materials that could be used as the adhesion layer **340** (also labeled **240a/240b**), but does not discuss copper. *See* paragraph 25 (discussing various materials for the adhesion layer, *e.g.*, ruthenium, rhenium, nickel, palladium, osmium, iridium and platinum, tantalum, tantalum alloys, titanium, titanium alloys, tungsten and tungsten alloys). Therefore, the adhesion layer **340** does not meet the recitation of a "second layer comprising a plurality of atomic layers of copper" in Claim 33 as maintained in the Final Action.

Applicants note that the layer **360** in Park is described as a copper layer, and the catalyst **250b** is identified as iodine. *See* Park, paragraphs 29-30. However, the layer **360** is not "directly on the first layer comprising ruthenium" as recited in Claim 33 because the adhesion layer **340** in Park is between the ruthenium barrier layer **330** and the copper layer **360**. Therefore, the layer **360** also does not meet the recitation in Claim 33 of "a second layer comprising a plurality of atomic layers of copper directly on the first layer comprising ruthenium."



In response to Applicants' arguments with respect to layer **360**, the Final Action states on page 4 that Applicants recite "a third layer comprising iodine directly on the second layer [comprising a plurality of layers of copper, remote from the first layer comprising ruthenium]." To the extent that the Final Action is taking the position that the layer **360** is equivalent to "a third layer comprising iodine," the layer **360/370** is described by Park as a copper layer 360/370. Therefore, the copper layer **360/370** also does not meet the recitation of a third layer comprising iodine.

In addition, Applicants note that the iodine catalyst **250b** that is referred to in Park is not directly on a copper layer (such as the copper layer **360/370**) and is also not remote from layers **230/330** or **240/340** (which the Final Action identifies as equivalent to the first layer comprising ruthenium and the second layer comprising a plurality of atomic layers of copper, respectively). Park discusses depositing a copper layer with an iodine or iodine compound as a catalyst in paragraph 13. However, as shown in **Figures 2B** and **3**, the iodine catalyst **250b** is deposited before the copper layer **360/370** so that it is not remote from layers **230/330** or **240/340**. As noted in Park in paragraphs 29-30 (emphasis added):

[A] semiconductor substrate **200b**, on which an adhesion layer **240b** is preformed, is treated with iodine or iodine compound as a catalyst **250b**.

Referring to **FIG. 3** subsequently, a copper layer **360** is formed using (hfac)Cu(vtms) as a copper precursor on the surface of an adhesion layer **340** by using said chemical vapor deposition method.

Therefore, Park also does not meet the recitation of a "third layer comprising iodine directly on the second layer comprising a plurality of atomic layers of copper, remote from the first layer comprising ruthenium" in Claim 33.

Applicants submit that Claim 33 is patentable for at least the reasons discussed above. Claims 34-36 are patentable at least as depending from patentable Claim 33.

Accordingly, for at least the reasons discussed above, the recitations of the independent Claim 28 are not described or suggested by Kim and the recitations of the independent Claim 33 are not described or suggested by Park so that one or more elements needed for a *prima facie* rejection under 35 USC §102(e) are simply not present. Therefore, Applicants respectfully request Pre-Appeal Brief Review of the present application and that the rejections be reversed by the Pre-Appeal Brief Review Panel prior to the filing of an Appeal Brief .

Respectfully submitted,



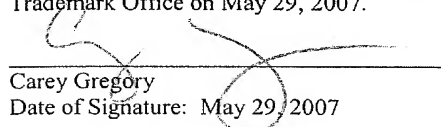
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**CERTIFICATION OF ELECTRONIC TRANSMISSION  
UNDER 37 CFR § 1.8**

I hereby certify that this correspondence is being transmitted electronically to the U.S. Patent and Trademark Office on May 29, 2007.



Carey Gregory

Date of Signature: May 29, 2007